

Appl. No. 10/072,415
Amdt. dated 06/01/2006
Response to Office Action dated 02/01/2006

REMARKS

Claims 74, 75, 77-86, 88-89, 92-94, 96, 102-106, 108, 109, 111, 113, 114, 116, 118 and 120-122 are pending in the present application. Applicants file this response to the non-final Action mailed 2/1/06.

Referring to claim 74, the method recites limitations of previously pending claim 76 which was rejected under 103 over Hirano and Gardner. Applicants respectfully submit that the Office has failed to establish a *prima facie* 103 rejection for at least the following compelling reasons.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See, e.g., MPEP §2-43 (8th ed., rev. 3).

MPEP 2142 (8th ed., rev. 3) states that the concept of *prima facie* obviousness allocates who has the burden of going forward with production of evidence in each step of the examination process and the *examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness*. The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness, that is, the initial burden

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is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. MPEP §2142 (8th ed., rev. 3).

Applicants respectfully submit the motivational rationale is insufficient in view of precedent set forth by the Federal Circuit, and accordingly, the Office has failed to meet their burden of establishing a proper prima facie 103 rejection.

The Federal Circuit discussed proper motivation *In re Lee*, 61 USPQ 2d 1430 (Fed. Cir. 2002). The Court in *In re Lee* stated the factual inquiry whether to combine references must be thorough and searching. It must be based on objective evidence of record. The Court in *In re Fritch*, 23 USPQ 2d 1780, 1783 (Fed. Cir. 1992) stated motivation is provided only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. The *Lee* Court stated that the Examiner's conclusory statements in the *Lee* case do not adequately address the issue of motivation to combine. The Court additionally stated that the factual question of motivation is material to patentability and *cannot be resolved on subjective belief and unknown authority*. The Court also stated that deficiencies of cited references cannot be remedied by general conclusions about what is basic knowledge or common sense but rather specific factual findings are needed. The Court further stated that the determination of patentability must be based on evidence. MPEP 2143.01 (8th ed., rev. 3) cites *In re Lee* and states the importance of relying upon objective evidence and making specific factual findings

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with respect to the motivation to combine references.

The teachings of col. 2, lines 34-35 of Gardner relied upon by the Office as allegedly providing motivation to combine the reference teachings are relevant to the teachings of Gardner and *have not been demonstrated to be applicable to Hirano*. In particular, there is no evidence of record that the teachings of Gardner would provide any improvements or benefits to the technology and arrangements of Hirano to motivate one to combine the teachings of Gardner with the teachings of Hirano. The Office baldly alleges on page 5 of the Action that the combination is appropriate to reduce non-uniformities that interfere with subsequent lithography steps and improving the process yield of devices. However, Applicants have failed to uncover any evidence that Hirano suffers from any problems with respect to "surface non-uniformities" to motivate one of skill in the art to look for solutions with respect thereto.

Further, Gardner is not concerned with formation of emitters; or that the emitter teachings of Hirano would be preserved by the combination of the teachings of Gardner. More specifically, the CMP planarization of Gardner forms a resultant planar surface void of any structures to accommodate an emitter. There is no evidence of record that emitter constructions of Hirano are compatible with the CMP planarization of planar surfaces of Gardner.

In sum, Gardner and Hirano are directed towards entirely different transistor constructions and Gardner has not been demonstrated to be applicable to transistor

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constructions which include emitters. There is no evidence that any improvements result from the combination or that one would otherwise be motivated to combine the reference teachings. Applicants respectfully submit that the Office has failed to meet their burden of establishing motivation to combine the reference teachings and the Office has failed to establish a proper prima facie 103 rejection for at least this reason. Applicants respectfully request allowance of claim 74 in the next Action for the above-mentioned compelling reasons.

Furthermore, proper prima facie 103 rejections require all limitations of the claim to be taught by the prior art. However, even if the prior art references are combined, positively-recited limitations of the claims are not disclosed nor suggested by the prior art and the rejection is improper for this additional reason. More specifically, Gardner is void of emitter teachings or alignment teachings of claim 74. In particular, Applicants have failed to uncover any teachings in the art taken alone or in combination of *polishing to form a gate aligned with the channel region of the semiconductive material* as specifically claimed. Applicants respectfully submit that the Office has failed to establish a prima facie 103 rejection of claim 74 for this additional compelling reason.

The claims which depend from independent claim 74 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to independent claim 79, the method recites providing a plurality of

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semiconductive regions and *wherein at least one of the semiconductor regions comprises an emitter*. Applicants have failed to uncover any teachings regarding an emitter in Gardner and accordingly pending claim 79 is not anticipated by Gardner. Furthermore, there is no motivation to modify or combine the teachings of Gardner to arrive at the limitations of claim 79 and claim 79 is not obvious. Applicants respectfully request allowance of claim 79 in the next Action.

The claims which depend from independent claim 79 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 83, the method defines providing one of the semiconductive regions comprising a plurality of emitters. Referring to page 3 of the Action, the Office states that col. 5, lines 64-67 of Hirano allegedly disclose the plurality of emitters. Applicants respectfully disagree. The teachings of Hirano relied upon by the Office state that emitter portions 14 and regions 17 are alternately formed on the surface of the substrate. The formation of a plurality of emitters 14 using separate semiconductive regions and alternated with a plurality of source regions 17 fails to disclose or suggest one of the semiconductor regions comprising a plurality of emitters as specifically claimed. Positively recited limitations of claim 83 are not disclosed nor suggested by the prior art and claim 83 is allowable for at least this reason.

The claims which depend from independent claim 83 are in condition for allowance

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for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

For example, referring to claim 86, Applicants respectfully submit the Office has failed to establish motivation in accordance with Federal Circuit authority to combine the reference teachings and the rejection is improper. Initially, *Gardner is void of emitter teachings* and accordingly Applicants respectfully submit that one of skill in the art *would not be motivated to look to Gardner for meaningful teachings regarding emitters, let alone meaningful teachings regarding a height relationship of an emitter tip to a semiconductive region*. The Office alleges that the combination is appropriate on page 6 of the Action to reduce surface non-uniformities that interfere with subsequent lithography steps and improving process yield. Applicants respectfully submit the motivation is improper for the reasons set forth above. Also, Applicants submit that the Office has failed to submit proper objective or other evidence that extending a surface of a gate and a surface of a semiconductor region above a tip would result in a more planarized surface as alleged, or that even if one were to combine the teachings that any improvements to the prior art structures would result from the combination to motivate one to combine the reference teachings. Applicants respectfully submit the Office has failed to meet their burden with respect to establishing proper motivation and the 103 rejection is improper for at least this reason.

Furthermore, even if the references are combined, the combination fails to disclose

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or suggest limitations of claim 86 and the 103 rejection is improper for this additional reason. The method recites a tip of one of the *emitters elevationally below* an upper surface of the gate and *an upper surface of another one of the semiconductive regions*. The Office states on page 6 of the Action that Hirano fails to teach a tip elevationally below an upper surface of a source. The Office identifies structure 110A of Fig. 1J in support of the rejection and to cure these deficiencies of Hirano. However, Fig. 1J fails to disclose an emitter and accordingly fails to teach any relationship of a *tip of an emitter below an upper surface of a semiconductive region* as claimed. Accordingly, even if the references are combined, the combination of prior art teachings fails to disclose or suggest limitations of claim 86 and the 103 rejection is improper for this additional reason.

Independent claim 89 recites limitations of previously pending claim 91 which was rejected under 103. Applicants submit there is no motivation to combine the teachings of Gardner with the teachings of Hirano for the compelling reasons mentioned above. In addition, the alleged motivation provided by the Office is not supported by objective evidence of record. More specifically, on pages 4-5 of the Action, the Office states reasons for the combination and relies upon the teachings of col. 5, lines 20-26 of Gardner. However, these teachings are void of disclosing precise control or improvement of performance of a device as alleged by the Office as the rationale to support the 103 rejection. The alleged motivation is not supported by objective evidence of record and Applicants respectfully assert the Office has failed to establish a proper 103 rejection for

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at least this reason.

The claims which depend from independent claim 103 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 93, the method recites limitations of previously pending claim 95. Claim 93 now recites the semiconductor regions comprise an upper surface substantially elevationally coincident with an upper surface of a gate. The Office on page 4 of the Action relies upon Fig. 1J of Gardner in support of the rejection. However, Fig. 1J shows upper surfaces of oxide 106A, 106B coincident with the upper surface of the gate. Gardner fails to disclose or suggest limitations of claim 93 and the method is allowable for at least this reason.

The claims which depend from independent claim 93 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to independent claim 102, the method recites limitations of previously pending claim 107 including providing the drain region comprising a field emitter. Applicants have failed to uncover any teachings or concern of Gardner with respect to an emitter. There is no motivation to combine the teachings of Harino with the teachings of Gardner. On page 5 of the Action, the Office relies upon *polishing teachings* of Gardner as providing support for the combination of references. The polishing of Gardner fails to

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motivate one to modify Hirano to arrive at the method of claim 102. In addition, the Office has failed to provide objective evidence that any improvement results from the combination of Gardner with Hirano to motivate one to combine the reference teachings. Applicant notes that the corresponding previously pending independent claim was rejected over Gardner not Harino. Applicants submit that it is erroneous to modify Harino by Gardner when Gardner was used as the primary reference and Harino fails to disclose numerous limitations of the claim (e.g., Harino uses a mask 13a over the gate). The Office has failed to meet their burden of establishing proper motivation and claim 102 is improper for at least this reason.

The claims which depend from independent claim 102 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to independent claim 108, the method recites limitations of previously pending claim 110 including providing the drain comprising a field emitter. Applicants have failed to uncover any teachings or concern of Gardner with respect to an emitter. There is no motivation to combine the teachings of Harino with the teachings of Gardner. On page 5 of the Action, the Office relies upon *polishing teachings* of Gardner as providing support for the combination of references. The polishing of Gardner fails to motivate one to modify Hirano to arrive at the method of claim 110. In addition, the Office has failed to provide objective evidence that any improvement results from the combination of Gardner

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with Hirano to motivate one to combine the reference teachings. Applicants submit that it is erroneous to modify Harino by Gardner when Gardner was used as the primary reference and Harino fails to disclose numerous limitations of the claim. The Office has failed to meet their burden of establishing proper motivation and claim 110 is improper for at least this reason.

The claims which depend from independent claim 110 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 116, the teachings of Hirano of col. 5 of alternating emitter projection portions 14 and source regions 17 on a surface of a substrate fails to teach or suggest the claimed providing of the drain semiconductive region comprising a plurality of emitters as positively claimed. Limitations of claim 116 are not disclosed nor suggested by the prior art and the rejection of claim 116 is improper for at least this reason.

Referring to claim 118, as discussed in further detail above with respect to claim 86, there is no motivation to combine the reference teachings and the rejection of claim 118 is improper for at least this reason. In addition, even if the references are combined, the combination fails to disclose or suggest the providing one of the semiconductor regions comprises *forming a tip of the emitter elevationally below an upper surface of the gate and an upper surface of another one of the semiconductive regions.* The Office has failed to establish a proper prima facie 103 rejection for at least these compelling reasons and claim

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118 is allowable.

Applicants hereby add new claims 120-122 which are supported at least by the teachings of Figs. 5-8 and 16-17 and associated specification teachings of the originally filed application.

Applicants request allowance of all pending claims.

The Examiner is requested to phone the undersigned if the Examiner believes such would facilitate prosecution of the present application. The undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).

Respectfully submitted,

Dated: 6/1/06

By: 
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